

## PATENT ABSTRACTS OF JAPAN

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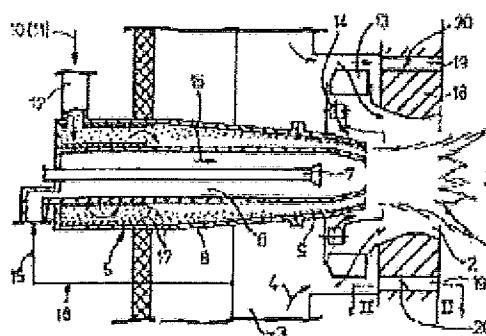
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## (54) PULVERIZED COAL BURNER

## (57) Abstract:

PROBLEM TO BE SOLVED: To reduce the outside diameter of an air register without affecting the flow rate of secondary air.



SOLUTION: Where a burner nozzle 9 passed through wind box 3 opens to a throat 2, air passageways 19 by which the wind box 3 communicates with a furnace 1 are formed through a furnace wall 18 at positions encircling the throat 2 and on the outer side of the circumference of an air register 13 provided around the periphery of the tip of the burner nozzle 9. Air flows from the wind box 3, through the air passageways 19, and into the furnace 1 so that the air register 13 can be made smaller.

## Partial Translation of Reference 1

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### Covering Page 3, Column 3, Line 8 to Column 4, Line 6:

[0019] According to the present invention, as shown in FIG. 1, a plurality of air channels 19 that run through a furnace wall 18 and provide communication from a ~~window~~ box 3 to a furnace 1 are arranged around a throat 2 at positions outside the outer diameter of an air register 13 arranged so as to circularly surround the outer periphery of the front end of a burner nozzle 9 so that air directly flows into the furnace 1 from the wind box 3 by way of the plurality of air channels 19.

[0020] As shown in FIG. 2, the air channels 19 are arranged obliquely relative to the furnace wall 18 so that air flowing into the furnace 1 through the plurality of air channels 19 forms swirling flows that swirl in the sense same as the sense of swirling of secondary air 4 flowing through the air register 13 and inner vane 14 around the flame bursting out from the throat 2 into the inside of the furnace 1.

[0021] Dampers 20 whose degrees of opening can be shifted are arranged respectively in the plurality of air channels 19 and the degrees of opening thereof can be adjusted collectively.

[0022] When the dampers 20 are held in an open state in the pulverized coal burner shown in FIG. 1, air directly flows into the furnace 1 from the wind box 3 by way of the plurality of air channels 19. Since the air channels 19 are arranged obliquely relative to the furnace wall 18 as shown in FIG. 2, the air flowing into the furnace 1 by way of the air channels 19 forms swirling flows so as to operate as secondary air that stably burns a pulverized coal 10 in the inside of the furnace 1.

[0023] As pointed out above, since air directly flows into the furnace 1 from the wind

box 3 by way of the plurality of air channels 19, the flow rate of the secondary air 4 being supplied to the furnace 1 by way of the air register 13 can be made lower than before so that the diameter of the air register 13 can be reduced to lessen the weight of the entire burner than before.

[0024] The pulverized coal 10 that flows forward whirling around the outside of a burner inner shell 6 is injected from the front end of the burner nozzle 9 and mixed with the primary air 11, tertiary air 15 and secondary air 4 that comes in by way of the air register 13 to burn and, after getting into the inside of the furnace 1 by way of the throat 2, it is made to burn further by air that flows into the furnace 1 by way of the air channels 19. As combustion takes place in two stages in this way, nitrogen oxides are generated to lesser extent than before.

[0025] When the load of the boiler is small and pulverized coal is burnt at a low rate, the secondary air 4 may be supplied at a low rate. However, flame may not be formed if air flows into the furnace mostly by way of the air channels that show a small resistance to flow and the secondary air 4 passes the air register 13 only at an excessively low rate. Then, the dampers 20 is adjusted in the sense of closing them to reduce the degree of opening and secure a sufficient flow rate for the secondary air 4 flowing through the air register 13.